

Managing Disaster Debris: Overview of Regulatory Requirements, Agency Roles, and Selected Challenges

Linda Luther
Analyst in Environmental Policy

March 17, 2010

Congressional Research Service
7-5700
www.crs.gov
RL34576

CRS Report for Congress
Prepared for Members and Committees of Congress
c11173008

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
17 MAR 2010		**00-00-2010 to 00-00-2010**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Managing Disaster Debris: Overview of Regulatory Requirements, Agency Roles, and Selected Challenges	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Congressional Research Service,Library of Congress,101 Independence Ave, SE,Washington,DC,20540-7500**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**13**	

Summary

After a disaster, when a region turns its attention to rebuilding, one of the greatest challenges to moving forward may involve how to properly manage debris generated by the event. Options include typical methods of waste management—landfilling, recycling, or burning. The challenge after a major disaster (e.g., a building or bridge collapse, or a flood, hurricane, or earthquake) is in managing significantly greater amounts of debris often left in the wake of such an event.

Debris after a disaster may include waste soils and sediments, vegetation (trees, limbs, shrubs), municipal solid waste (common household garbage, personal belongings), construction and demolition debris (in some instances, entire residential structures and all their contents), vehicles (cars, trucks, boats), food waste, so-called white goods (refrigerators, freezers, air conditioners), and household hazardous waste (cleaning agents, pesticides, pool chemicals). Each type of waste may contain or be contaminated with certain toxic or hazardous constituents. In the short term, removal of debris is necessary to facilitate the recovery of a geographic area. In the long term, the methods by which these wastes are to be managed require proper consideration to ensure that their management (by landfilling, for example) will not pose future threats to human health or the environment.

After a presidentially declared disaster, federal funding or direct assistance in response to the disaster may be available to a state or local government. The Federal Emergency Management Agency (FEMA) may provide funding through its Public Assistance (PA) Grant Program for debris removal operations that eliminate immediate threats to lives, public health, and safety, or eliminate immediate threats of significant damage to improved public or private property. The federal share of funding to the affected area will be stated in the disaster declaration, but will be no less than 75%. The funding will be available for response activities in a designated geographic area for a specific period of time.

In addition to funding, if the state or local government does not have the capability to respond to the disaster, it may request direct federal assistance from FEMA. Federal agencies most likely to assist with debris removal operations are the U.S. Army Corps of Engineers (the Corps) and the U.S. Environmental Protection Agency (EPA). Activities they may perform include right-of-way clearance, curbside waste pickup, private property debris removal, property demolition, assistance with contaminated debris management, and collection of household hazardous waste.

Contents

Introduction 1
Types and Amount of Debris 1
Federal and State Waste Management Requirements 3
Federal and State Agency Roles in Debris Removal 5
- Federal Agency Roles 6
  - FEMA 6
  - The Corps 7
  - EPA 7
- State and Local Agency Roles 8

Selected Challenges to Managing Disaster Debris 8
- Managing Large Volumes of Waste 8
- Ensuring the Ability of Residents to Return to a Disaster Area 9
- Separating Hazardous and Nonhazardous Wastes 9
- Managing Asbestos-Containing Materials 9

For Additional Information 10

Contacts

Author Contact Information 10

Introduction

In the aftermath of a major natural disaster, a potential threat to safety and obstacle to recovery and rebuilding is the presence of significant amounts of disaster debris. Depending on the type of disaster, debris may include waste soils and sediments, vegetation (trees and shrubs), man-made structures (collapsed homes, buildings, or bridges), and personal property. The ability of residents to return to the area and live in a safe and healthy environment may depend on how quickly and effectively a community manages its debris.

There are many factors that influence the proper and timely management of disaster debris. For one, the sheer volume of debris can overwhelm a community. As an illustration, what follows are disaster debris amounts generated during three major disasters:

- Hurricane Katrina, 2005—more than 118 million cubic yards (CY)[1] over a 93,000-square-mile area.
- Hurricane Andrew, 1992—43 million CY over a 500-square-mile area.
- The Northridge Earthquake, 1994—7 million CY.

A large volume of waste can quickly overburden existing landfill space. The likely best choice for most regions will involve diverting as much debris as possible from area landfills (through recycling, burning, composting, or another method of volume reduction) the logistics of which, however, can prove complicated without proper pre-disaster planning.

Also, the desire to manage disaster debris as quickly as possible can have detrimental long-term repercussions if debris is managed improperly. During a disaster, some amount of hazardous waste will likely be commingled with nonhazardous wastes (for instance, under flooding conditions, household hazardous waste or sewage may contaminate nonhazardous personal property). Afterward, improper disposal of hazardous waste may lead to future environmental, health, or safety problems, such as the contamination of local groundwater.

This report addresses debris resulting from a "major disaster" or "emergency" declared by the President. First, it discusses the types of debris commonly generated during and after a disaster and selected factors that can make "debris removal"[2] such a costly, complex operation. Second, it discusses the roles of federal, state, and local agencies after a disaster has been declared—with regard to both funding debris removal and the actual physical process of removal.

Types and Amount of Debris

Generally, "disaster debris" includes waste materials created after a natural disaster such as an earthquake, tornado, fire, flood, hurricane, or winter snow or ice storm. Before a community can move forward with debris recovery, it must have some understanding of the types of debris involved and the volume it must handle.

[1] By way of comparison, a cubic yard is approximately the size of a conventional dishwasher.

[2] In this report, the term "debris removal" is used broadly. Where necessary, actions such as disposal or recycling are referred to specifically.

The type of debris generated is largely dependent upon the nature of the disaster.[3] For example, debris caused by flooding differs somewhat from debris resulting from an earthquake or tornado. Each category of debris poses individual challenges to disposal, particularly when generated in significant amounts or when forms of waste become mixed with one another to the point that separation is difficult. Typical disaster debris includes

- municipal solid waste (MSW)—personal belongings and general household trash;
- soil and sediment;
- putrescibles—animal carcasses (pets or farm animals), rotten or spoiled fruits, vegetables, seafood, or meats;
- white goods—refrigerators, freezers, air conditioners, washers, dryers, stoves, water heaters, and dishwashers;
- household hazardous waste—oil, pesticides, paints, cleaning agents;
- construction and demolition (C&D) debris—road, bridge, or building materials such as metals, asphalt, drywall, plaster, brick, concrete, roofing materials, and treated or untreated lumber;
- vegetative debris—trees, branches, shrubs, and logs;
- vehicles and vessels—cars, trucks, and boats, fuel, motor oil, batteries, and tires; and
- electronic waste—computers, televisions, printers, stereos, DVD players, and telephones.

To appropriately manage these different waste streams, it is also necessary to estimate the total volume of debris. This is important for various reasons, including the identification of appropriate staging grounds to separate wastes, determination of necessary landfill space, determination of necessary contract services, and anticipation of special handling requirements applicable to hazardous debris.

There are various methods of estimating debris totals. The U.S. Army Corps of Engineers (the Corps) uses mathematical modeling forecasts that take into account such factors as the number of households affected, the amount of vegetative cover in a given area, commercial density, and a storm's intensity.[4]

To effectively manage disaster debris, the U.S. Environmental Protection Agency (EPA) and the Federal Emergency Management Agency (FEMA) recommend that states develop a disaster debris management plan before a disaster strikes. Such plans delineate the types of disaster debris that will be handled under particular emergency conditions and existing laws that apply to the handling and disposal of different types of waste (i.e., hazardous waste, nonhazardous waste, asbestos-containing materials). State plans may also specify requirements regarding a selection of

[3] For more information, see the Environmental Protection Agency's report *Planning for Natural Disaster Debris*, March 2008, pp. 6-7, available at http://www.epa.gov/epawaste/conserve/rrr/imr/cdm/debris.htm and the Federal Emergency Management Agency's *FEMA-325, Public Assistance: Debris Management Guide*, July 2007, pp. 54-57, available at http://www.fema.gov/government/grant/pa/demagde.shtm.

[4] *FEMA-325, Public Assistance: Debris Management Guide*, pp. 53-62 and Appendix B.

debris storage and staging sites and waste-handling methods (e.g., chipping/grinding, burning, or landfilling) for certain types of waste, provide an inventory of debris capacity at local debris management facilities—including recycling, waste to energy, and disposal options—and evaluate equipment and administrative needs such as pre-negotiated waste management contracts and pre-qualified contractors.[5]

Federal and State Waste Management Requirements

Generally, disaster debris will be sent to a landfill or it may be managed in some way that reduces its volume (such as open burning/incineration,[6] recycling, or chipping and grinding). Each choice involves activities that may require compliance with certain local, state, or federal regulations. For example, states are required to manage solid and hazardous waste in accordance with provisions of the Resource Conservation and Recovery Act (RCRA).[7] (In addition to RCRA, depending on how waste is managed, provisions of other environmental laws such as the Clean Air Act or Clean Water Act may also apply.)

Under RCRA, businesses that generate hazardous waste above certain thresholds must transport, treat, store, and dispose of their hazardous waste in accordance with certain regulatory requirements. However, households and certain small businesses are essentially exempt from RCRA. This means that hazardous waste generated by these entities can be disposed of in common household or municipal garbage. After a disaster, this can be a particular concern when hazardous waste is generated in significant amounts by these unregulated entities.

Although any waste management choice may involve certain environmental concerns, landfilling and burning generally cause the most concern among a region's residents. With regard to landfilling, municipal solid waste landfills are predominantly regulated by state and local governments. EPA has, however, established minimum criteria that these landfills must meet. States are then authorized to implement their own criteria, provided they are at least as stringent as federal requirements.

Often, a sizable proportion of disaster debris is managed as construction and demolition (C&D) waste. Under federal law, C&D waste is classified neither as hazardous waste nor as municipal solid waste. Therefore, C&D landfills are not subject to federal design and operational criteria (i.e., C&D landfills are not required under federal law to have protective liners that a municipal solid waste landfill, which is expected to receive a certain amount of hazardous waste from households, would have).

[5] EPA, *Planning for Natural Disaster Debris*, pp. 3-31.

[6] Open burning includes both burning debris in an open pit and burning debris in an air curtain incinerator (ACI). The air curtain method incorporates a pit constructed by digging below grade or building above grade (if there is a shallow groundwater table) and a blower. The blower and pit make up an engineered system which must be precisely configured to properly function. The blower must have adequate air velocity to provide a "curtain effect" to hold smoke in and to feed air to the fire below. See EPA's, "Planning for Natural Disaster Debris, pp. 30.

[7] Solid waste is defined broadly under the law as "any garbage, refuse ... and other discarded material" (42 U.S.C. § 6903). Hazardous waste, a subset of solid waste, is defined as a solid waste that is either specifically listed in the regulations (40 C.F.R. §§ 261.31-261.33) or meets specific criteria that make it toxic, ignitable (i.e., burns readily), corrosive, or reactive (e.g., explosive) (40 C.F.R. § 261.3).

The disposal of C&D waste is primarily a state-regulated issue. This means that states have the authority to determine what criteria a C&D landfill must meet and what materials constitute C&D waste. In the event of an emergency, a state may change the regulatory definition of C&D debris to more broadly characterize larger volumes of debris that have been generated in the wake of a particular disaster. One issue of concern with this approach is that C&D waste commingled with more hazardous materials could be disposed of at landfills that are not designed to accept such wastes. Therefore, it is suggested that hazardous materials such as asbestos, lead-based paint, PCBs, and any other contaminated materials should be separated from C&D waste before landfill disposal.[8] Further, to lessen the burden on disposal facilities and potentially reduce costs, it is recommended that C&D waste be reused and recycled.

Like C&D waste, vegetative debris often represents a significant proportion of disaster debris. Vegetative debris can be chipped or ground up for re-use. It is estimated that the volume of vegetative debris can be reduced by as much as 75% using this method of waste reduction. Because of the potentially huge volume of vegetative debris following a disaster, burning may be a preferred method of waste-handling (which reduces the waste by as much as 95%). If that is the case, local, state, or federal regulations that control emissions of air pollutants will likely apply. Further, when mixed or contaminated with other wastes (such as sewage), burning may not be an option. Also, if residents have begun to return to a disaster area, there may be significant opposition to burning by community members who would be affected by the smoke.[9]

Following are other common categories of waste and special handling requirements, pursuant to local, state, or federal regulations or recommendations, that apply to each:

- **White goods** must be separated from other waste and delivered to certified recyclers permitted to drain refrigerants and other regulated chemicals and oils.
- **Household hazardous waste (HHW)** should be collected separately and disposed of in specially designed landfills.
- **Putrescible wastes** rot or decay quickly, and must be managed quickly to avoid disease vectors (rodents, flies, mosquitoes). Some putrescibles can be composted and rendered.
- **Electronic wastes**, which contain lead, mercury, and other heavy metals, should be separated from other waste recycled or disposed of as HHW.
- **Automobiles and boats** generally can be recycled, but gas tanks, mercury switches, batteries, and tires should be removed and managed separately.
- **Soils and sediments** can be reused. However, in agricultural areas, soil may be too contaminated with fertilizers or other chemicals to be used on residential or agricultural lands.

[8] EPA, *Planning for Natural Disaster Debris*, p. 22-24.

[9] The impact to the community depends on the burning method used. For example, air curtain pit incinerators have fewer environmental impacts than uncontrolled open-air burning.

Federal and State Agency Roles in Debris Removal

Federal agency response to debris removal after a disaster is generally done in accordance with provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (The Stafford Act, 42 U.S.C. §§ 5121-5206) and the National Response Plan.[10] The Stafford Act authorizes the President to issue a "major disaster" or "emergency" declaration in response to catastrophes that overwhelm state and local governments. The declaration may also authorize all federal agencies, as necessary, to provide assistance to respond to a disaster, including the "demolition of unsafe structures which endanger the public" (§ 5170b) and debris removal activities (§ 5173).[11] The declaration will also specify geographic areas over which the declaration is made.

The National Response Plan (NRP) was developed by the Department of Homeland Security (DHS) to structure the way responders work together and to provide supporting mechanisms for disasters so serious that the Secretary of DHS declares them to be "Incidents of National Significance."[12] The NRP applies to situations in which the resources of state and local authorities are overwhelmed and authorities have requested federal assistance. Various federal statutory authorities and policies provide the basis for federal actions and activities in the context of domestic incident management under the NRP. The NRP does not confer new authorities upon the Secretary of DHS or any other federal official. Rather, the NRP establishes the coordinating structures, processes, and protocols required to integrate the specific statutory and policy authorities of various federal departments and agencies. As with the Stafford Act, the President has designated DHS as the implementing agency for the NRP.

Under the NRP, DHS identifies and groups the capabilities of federal departments and agencies into 15 Emergency Support Functions (ESFs) to provide the planning, support, resources, program implementation, and emergency services most likely to be needed.[13] Two ESFs include debris removal missions:

- ESF #3, Public Works and Engineering—this includes infrastructure protection and emergency repair, infrastructure restoration, engineering services, construction management, and critical infrastructure liaison. The Corps is the lead agency to complete this ESF.[14]
- ESF #10, Oil and Hazardous Materials Response—this includes oil and hazardous materials response and environmental safety and short- and long-term cleanup. EPA is the lead agency to complete this ESF; the Corps provides support.[15]

[10] For more information on provisions of the Stafford Act and the National Response Plan, see CRS Report RL33053, *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding*, by Keith Bea.

[11] The Stafford Act and implementing regulations use the term "debris removal" in a broad sense to encompass the entire process of removing, handling, recycling, and disposing of debris (44 C.F.R. 206.224).

[12] In accordance with provisions of the NRP, all presidentially declared disasters and emergencies under the Stafford Act are considered Incidents of National Significance (see "Section II. Planning Assumptions and Consideration" of the NRP, available at https://www.fema.gov/pdf/emergency/nrf/nrf-core.pdf).

[13] See FEMA's *National Response Framework*, available at https://www.fema.gov/emergency/nrf/.

[14] See FEMA's the *National Response Framework*, "Emergency Support Function #3—Public Works and Engineering Annex," available at https://www.fema.gov/pdf/emergency/nrf/nrf-esf-03.pdf.

[15] See FEMA's the *National Response Framework*, "Emergency Support Function #10—Oil and Hazardous Materials Response Annex," available at https://www.fema.gov/pdf/emergency/nrf/nrf-esf-10.pdf.

Federal Agency Roles

FEMA

FEMA serves two primary roles in debris removal operations. First, it provides funding to eligible applicants. Second, it may provide direct federal assistance to an applicant (state or local government) that does not have the capability to respond to a presidentially declared disaster.[16]

Funding debris removal

With regard to funding, FEMA provides grant assistance to reimburse state, tribal, and local governments, and certain types of private nonprofit organizations for their response and recovery efforts. This is done through FEMA's Public Assistance (PA) Grant Program. To be eligible for PA funding, the debris removal work must

- be a direct result of a presidentially declared disaster,
- occur within the designated disaster area, and
- be the legal responsibility of the applicant at the time of the disaster.[17]

Eligible activities must also be in the public interest, which is defined as activities that will

- eliminate an immediate threat to lives, public health, and safety;
- eliminate immediate threats of significant damage to improved public or private property;
- ensure the economic recovery of the affected community to the benefit of the community-at-large; or
- mitigate the risk to life and property by removing substantially damaged structures and associated appurtenances as needed to convert property acquired through a FEMA hazard mitigation program to uses compatible with open space, recreation, or wetlands management practices.[18]

The disaster declaration will state whether debris removal operations will be funded. The federal share will also be specified. That share will be no less than 75%, but may be more if requested by the state and approved by the President.

Providing direct assistance

When an affected state or local government does not have the capability required to respond to a presidentially declared disaster, it may a request direct federal assistance from FEMA.[19] The approved request is called a "mission assignment." A mission assignment is a work order issued by FEMA to another federal agency directing completion of a specific assignment in response to

[16] 42 U.S.C. § 5172.

[17] 44 C.F.R. 206.223(a).

[18] 44 C.F.R. 206.224(a).

[19] 42 U.S.C. §5173.

a presidential declaration of a major disaster or emergency.[20] To have debris removal activities mission assigned,

- the state must specifically request it from FEMA,
- the community must demonstrate that the required disaster-related efforts exceed state and local resources, and
- the scope of work must include specific quantifiable, measurable tasks.

Eligible debris-related activities include

- removing debris from critical roadways and facilities;
- removing debris from curbsides or from eligible facilities and hauling it to either temporary or permanent disposal sites;
- identifying, designing, operating, and closing debris management sites;
- monitoring debris removal operations; and
- demolishing and/or removing disaster-damaged structures and facilities in accordance with FEMA regulations and policies.

Depending on the nature and location of debris (e.g., on farmland, highways, in the coastal zone), many federal agencies may provide assistance in fulfilling requirements of the applicable ESF. However, the Corps and EPA are the two lead agencies responsible for completing debris-related ESFs.

The Corps

The Corps acts as the coordinator for ESF #3 (Public Works and Engineering). The Corps's mission includes right-of-way clearance, curbside pickup, private property debris removal, and property demolition. Included within its ESF #3 mission is providing personnel for the debris removal team, obtaining a contractor to execute the mission, and coordinating landfill and burn sites and the final disposal of debris. The management of contaminated debris is coordinated with EPA under ESF #10.

EPA

Under ESF #3, EPA assists local agencies in locating disposal sites for debris clearance activities and assists with contaminated debris management activities by coordinating and/or providing resources, assessments, data, expertise, technical assistance, monitoring, and other appropriate support.

EPA is the lead federal agency under ESF #10 (Oil and Hazardous Materials Response). Under the mission, FEMA funds EPA's retrieval and disposal of orphan tanks and drums and the collection of household hazardous waste; the collection of liquid and semi-liquid waste has also been tasked to ESF #10.

[20] *FEMA-325, Public Assistance: Debris Management Guide*, p. 141.

EPA generally works with other federal agencies (particularly the Corps), state agencies, and local governments to facilitate the collection, segregation, and management of waste. EPA may also provide guidance on such issues as burning debris, proper disposal of equipment that may contain PCBs, and proper handling and disposal of asbestos-containing debris.

State and Local Agency Roles

The states help coordinate local government requests for federal assistance and work with FEMA to define the mission. The Corps coordinates with state representatives regarding operational issues. Alternatively, state or local governments may choose to accept the debris removal mission themselves and apply to FEMA for reimbursement.

Local agencies are responsible for providing Rights-of-Entry permits to allow the Corps or its contractors to enter private property for debris removal activities (within the Corps's authority), establishing criteria and procedures for classifying different types of debris, selecting disposal methods and approving disposal operations, condemning properties, providing demolition plans, and designating the appropriate type of landfill.

State environmental protection agencies or departments of environmental quality are the environmental regulatory arms of state governments. A state environmental agency may issue a declaration of emergency after a disaster. Such a declaration would specify how debris removal operations should be carried out for the particular disaster. For example, after Hurricane Katrina, the Louisiana Department of Environmental Quality expanded the definition of C&D waste to essentially allow the entire contents of flooded homes in New Orleans to be disposed of in C&D landfills. Each state is authorized to implement its own solid and hazardous waste management programs, including siting and permitting of debris disposal sites.

Selected Challenges to Managing Disaster Debris

There are many challenges to managing disaster debris, particularly if a region does not have a debris management plan in place. Some of these challenges include issues associated with managing large volumes of waste, ensuring the ability of property owners to return to an area and assist with cleanup, separating hazardous and nonhazardous waste, and managing asbestos-contaminated wastes.

Managing Large Volumes of Waste

The logistics of managing tens of thousands or millions of cubic yards of waste form a daunting task, even when a community is prepared. When not prepared, a region must coordinate the physical removal of debris, and likely designate a temporary staging area to sort and separate the waste before determining the appropriate management method. If debris removal contractors have not already been identified, it may be time-consuming to find a sufficient number of waste haulers able or qualified to do the work.

Further, as discussed previously, it is generally recommended that communities conserve landfill space as much as possible by reusing and recycling their disaster debris. However, this is an option only in so far as there are available markets for those materials.

Ensuring the Ability of Residents to Return to a Disaster Area

In the event of widespread devastation to a region, the speed with which cleanup and rebuilding occurs may depend on how quickly debris on private property can be removed. Generally, debris removal from private property does not qualify for federal funding because it is considered a responsibility of individual property owners that may be covered by private insurance. However, if residents move disaster-generated debris to a public right-of-way (e.g., curbside), federal funding of debris removal may be available. Therefore, to a certain degree, the speed with which debris from private property is removed will depend upon the speed with which residents are able to return to the area and assist in the cleanup.

Separating Hazardous and Nonhazardous Wastes

As discussed above, the separation of waste is also necessary to comply with existing local, state, and federal waste management regulations. To ensure that disaster debris is managed appropriately, returning residents are generally asked to separate debris as much as possible. If residents do not or are unable to separate their waste, waste management contractors or landfill operators may have to do so. Separating debris is a time-consuming, costly, and potentially dangerous process. Further, disaster debris may be mixed to the point that separation is either very difficult or essentially impossible (i.e., in flooding situations). This may mean that hazardous waste is mixed with nonhazardous waste and disposed of in a landfill not intended to hold such waste.

Managing Asbestos-Containing Materials

If a disaster involves the destruction of homes and buildings built before the late 1970s, the presence of asbestos-containing materials (ACM) will likely be a concern. The need to segregate that material before demolition and disposal will add to the time it takes to demolish individual structures. Both federal and state laws specify criteria that must be met when demolishing a structure with asbestos-containing materials.[21] Further, after a disaster, states will likely develop their own protocols for complying with asbestos requirements as they apply to the destruction and cleanup. EPA will generally work closely with affected states and provide debris management guidance specific to their disaster conditions. For example, after Hurricane Katrina, EPA advised states to make efforts to segregate asbestos and certain other types of waste for proper disposal in landfills prior to burning the debris.[22]

[21] The Clean Air Act (§ 112) establishes national emissions standards for hazardous air pollutants (NESHAP), including asbestos. Individual states, in coordination with EPA, must manage ACM in compliance with the asbestos NESHAP, with regard to asbestos removal and disposal during building destruction and renovation (40 C.F.R. §§ 61.140-61.160).

[22] EPA website, Hurricane Katrina Response, Frequent Questions, "Asbestos," available at http://www.epa.gov/katrina/faqs.htm.

For Additional Information

Following are selected guidance, fact sheets, and Web pages produced by FEMA, EPA, and the Corps to assist applicants with the federal funding process, disaster debris planning, and debris removal operations:

- FEMA report *FEMA-325, Public Assistance: Debris Management Guide*, July 2007, available at http://www.fema.gov/government/grant/pa/demagde.shtm.
- EPA Web page "Dealing with Debris and Damaged Buildings," available at http://www.epa.gov/naturalevents/returnhomeadvisory.htm. This Web page includes links to various guidance documents and additional Web pages regarding disaster debris management.
- EPA Web page "Disaster Debris," available at http://www.epa.gov/epawaste/conserve/rrr/imr/cdm/debris.htm. This Web page includes EPA's March 2008 report *Planning for Natural Disaster Debris.*
- The Corps "Debris Management" fact sheet, available at http://www.swg.usace.army.mil/CorpsHurricaneResponse/.

Author Contact Information

Linda Luther
Analyst in Environmental Policy
lluther@crs.loc.gov, 7-6852